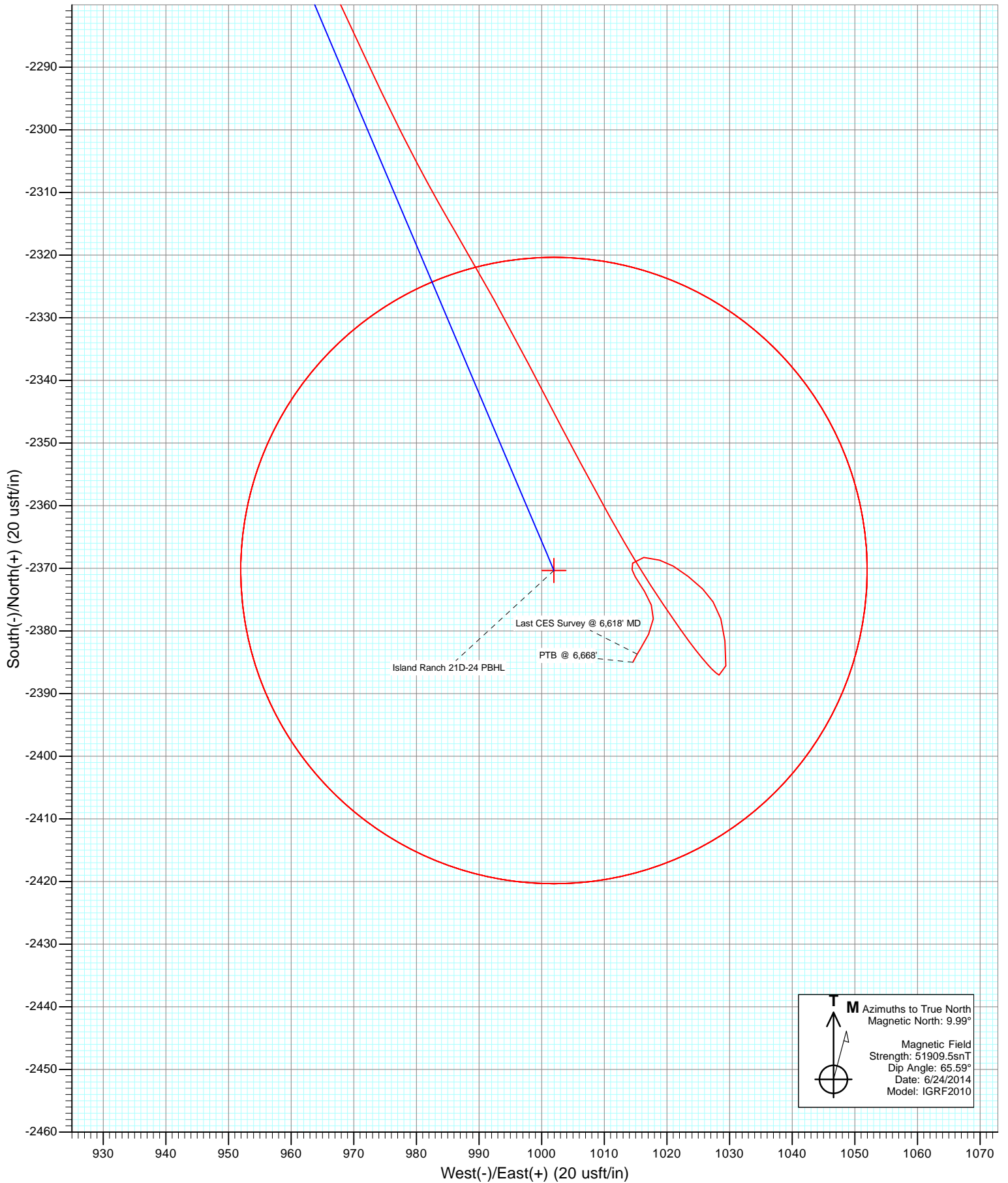




Project: Garfield County, CO
Site: S13-T7S-R96W (Island Ranch)
Well: Island Ranch 21D-24
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company: Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference: Well Island Ranch 21D-24
Project: Garfield County, CO	TVD Reference: KB=20' @ 5100.0usft (Patterson #303)
Site: S13-T7S-R96W (Island Ranch)	MD Reference: KB=20' @ 5100.0usft (Patterson #303)
Well: Island Ranch 21D-24	North Reference: True
Wellbore: DD	Survey Calculation Method: Minimum Curvature
Design: FINAL	Database: USA EDM 5000 Multi Users DB

Project Garfield County, CO		
Map System: US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)		
Map Zone: Colorado Central 502		

Site S13-T7S-R96W (Island Ranch)				
Site Position:	Northing:	1,019,013.23 usft	Latitude:	40.624725
From: Lat/Long	Easting:	2,338,017.18 usft	Longitude:	-104.282679
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16"		Grid Convergence:	0.77 °

Well Island Ranch 21D-24				
Well Position	+N/-S	0.0 usft	Northing:	593,080.25 usft
	+E/-W	0.0 usft	Easting:	1,275,990.15 usft
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft
			Latitude:	39.433758
			Longitude:	-108.063594
			Ground Level:	5,055.5 usft

Wellbore DD					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/24/2014	9.99	65.59	51,910

Design FINAL				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	157.09

Survey Program		Date 7/3/2014
From (usft)	To (usft)	Survey (Wellbore)
141.0	6,668.0	Survey #1 (DD)
		Tool Name ISCWSA MWD
		Description MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
141.0	0.30	24.80	141.0	0.3	0.2	-0.2	0.21	0.21	
203.0	0.80	151.70	203.0	0.1	0.4	0.1	1.63	0.81	
265.0	2.00	153.50	265.0	-1.2	1.1	1.6	1.94	1.94	
325.0	4.20	161.10	324.9	-4.3	2.3	4.8	3.72	3.67	
417.0	8.00	157.00	416.3	-13.3	5.9	14.6	4.15	4.13	
508.0	11.60	152.90	506.0	-27.3	12.5	30.0	4.03	3.96	
600.0	14.60	154.50	595.6	-46.0	21.7	50.9	3.28	3.26	
691.0	17.50	155.00	683.0	-68.8	32.5	76.0	3.19	3.19	
783.0	20.60	159.80	770.0	-96.5	43.9	106.0	3.77	3.37	
875.0	23.30	159.50	855.3	-128.8	55.9	140.3	2.94	2.93	
970.0	26.20	160.60	941.6	-166.1	69.4	180.1	3.09	3.05	
1,074.0	29.00	161.90	1,033.7	-211.8	84.9	228.1	2.75	2.69	

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference:	Well Island Ranch 21D-24
Project:	Garfield County, CO	TD Reference:	KB=20' @ 5100.0usft (Patterson #303)
Site:	S13-T7S-R96W (Island Ranch)	MVD Reference:	KB=20' @ 5100.0usft (Patterson #303)
Well:	Island Ranch 21D-24	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,169.0	32.50	161.10	1,115.4	-257.8	100.3	276.5	3.71	3.68	
1,264.0	35.60	157.90	1,194.1	-307.6	119.0	329.7	3.77	3.26	
1,359.0	38.90	156.80	1,269.7	-360.7	141.1	387.1	3.54	3.47	
1,455.0	43.20	155.80	1,342.1	-418.4	166.5	450.2	4.53	4.48	
1,550.0	46.30	156.50	1,409.5	-479.5	193.5	517.0	3.30	3.26	
1,645.0	47.90	155.90	1,474.2	-543.2	221.6	586.6	1.75	1.68	
1,740.0	47.60	155.40	1,538.1	-607.3	250.6	656.9	0.50	-0.32	
1,835.0	50.60	157.90	1,600.3	-673.2	279.0	728.7	3.73	3.16	
1,930.0	50.20	157.10	1,660.8	-740.8	307.0	801.9	0.77	-0.42	
2,025.0	49.50	156.70	1,722.1	-807.6	335.5	874.5	0.80	-0.74	
2,120.0	48.70	156.60	1,784.3	-873.5	364.0	946.3	0.85	-0.84	
2,215.0	51.00	157.10	1,845.5	-940.3	392.5	1,018.9	2.45	2.42	
2,310.0	50.90	156.70	1,905.4	-1,008.1	421.5	1,092.7	0.34	-0.11	
2,405.0	51.20	156.10	1,965.1	-1,075.8	451.0	1,166.6	0.58	0.32	
2,500.0	51.30	155.90	2,024.6	-1,143.5	481.2	1,240.6	0.20	0.11	
2,595.0	51.60	155.60	2,083.8	-1,211.3	511.7	1,314.9	0.40	0.32	
2,691.0	49.80	156.30	2,144.6	-1,279.1	542.0	1,389.2	1.96	-1.88	
2,785.0	47.50	156.80	2,206.7	-1,343.8	570.1	1,459.7	2.48	-2.45	
2,880.0	46.60	156.70	2,271.4	-1,407.7	597.5	1,529.3	0.95	-0.95	
2,976.0	46.50	155.20	2,337.4	-1,471.4	625.9	1,599.0	1.14	-0.10	
3,071.0	46.90	155.50	2,402.6	-1,534.2	654.7	1,668.1	0.48	0.42	
3,166.0	45.90	157.10	2,468.1	-1,597.2	682.4	1,736.8	1.61	-1.05	
3,261.0	45.20	155.60	2,534.6	-1,659.3	709.6	1,804.6	1.35	-0.74	
3,356.0	42.50	157.20	2,603.1	-1,719.6	736.0	1,870.4	3.07	-2.84	
3,451.0	41.60	156.50	2,673.7	-1,778.1	761.0	1,934.1	1.07	-0.95	
3,546.0	42.10	156.50	2,744.4	-1,836.2	786.2	1,997.5	0.53	0.53	
3,641.0	40.30	159.80	2,815.9	-1,894.3	809.6	2,060.0	2.97	-1.89	
3,737.0	39.70	159.10	2,889.5	-1,952.1	831.2	2,121.7	0.78	-0.63	
3,831.0	35.70	159.40	2,963.8	-2,005.8	851.6	2,179.1	4.26	-4.26	
3,927.0	34.10	159.40	3,042.6	-2,057.2	870.9	2,234.0	1.67	-1.67	
4,021.0	31.30	157.10	3,121.7	-2,104.4	889.7	2,284.7	3.26	-2.98	
4,117.0	30.00	155.50	3,204.2	-2,149.2	909.3	2,333.6	1.60	-1.35	
4,212.0	26.20	157.40	3,288.0	-2,190.2	927.3	2,378.4	4.11	-4.00	
4,307.0	24.30	155.30	3,374.0	-2,227.3	943.5	2,418.9	2.21	-2.00	
4,402.0	21.40	155.10	3,461.5	-2,260.8	959.0	2,455.8	3.05	-3.05	
4,497.0	19.40	154.90	3,550.5	-2,290.8	972.9	2,488.9	2.11	-2.11	
4,592.0	15.70	149.50	3,641.1	-2,316.2	986.2	2,517.4	4.25	-3.89	
4,687.0	14.00	152.70	3,732.9	-2,337.5	998.0	2,541.6	1.99	-1.79	
4,782.0	13.00	151.60	3,825.3	-2,357.1	1,008.3	2,563.7	1.09	-1.05	
4,877.0	9.00	147.10	3,918.5	-2,372.7	1,017.4	2,581.6	4.30	-4.21	
4,972.0	5.70	142.40	4,012.7	-2,382.7	1,024.4	2,593.5	3.53	-3.47	
5,067.0	1.50	118.10	4,107.5	-2,387.0	1,028.3	2,599.0	4.61	-4.42	
5,162.0	2.50	359.60	4,202.5	-2,385.5	1,029.4	2,598.1	3.66	1.05	
5,257.0	2.30	356.00	4,297.4	-2,381.6	1,029.3	2,594.4	0.26	-0.21	
5,351.0	2.10	342.20	4,391.4	-2,378.0	1,028.6	2,590.9	0.60	-0.21	
5,446.0	1.50	327.00	4,486.3	-2,375.3	1,027.4	2,587.9	0.80	-0.63	
5,542.0	1.70	315.10	4,582.3	-2,373.3	1,025.7	2,585.4	0.40	0.21	
5,637.0	2.00	307.50	4,677.2	-2,371.3	1,023.4	2,582.6	0.41	0.32	
5,732.0	1.50	300.40	4,772.2	-2,369.6	1,021.0	2,580.2	0.57	-0.53	
5,827.0	1.40	286.10	4,867.1	-2,368.7	1,018.8	2,578.5	0.39	-0.11	
5,922.0	1.70	274.30	4,962.1	-2,368.3	1,016.3	2,577.1	0.46	0.32	
6,017.0	1.30	199.80	5,057.1	-2,369.2	1,014.5	2,577.2	1.94	-0.42	
6,111.0	1.70	146.10	5,151.1	-2,371.3	1,014.9	2,579.4	1.49	0.43	

Cathedral Energy Services

Survey Report

Company: Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference: Well Island Ranch 21D-24
Project: Garfield County, CO	TVD Reference: KB=20' @ 5100.0usft (Patterson #303)
Site: S13-T7S-R96W (Island Ranch)	MD Reference: KB=20' @ 5100.0usft (Patterson #303)
Well: Island Ranch 21D-24	North Reference: True
Wellbore: DD	Survey Calculation Method: Minimum Curvature
Design: FINAL	Database: USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
6,206.0	1.60	149.10	5,246.0	-2,373.6	1,016.4	2,582.1	0.14	-0.11	
6,301.0	1.40	159.00	5,341.0	-2,375.9	1,017.5	2,584.5	0.34	-0.21	
6,394.0	1.40	184.20	5,434.0	-2,378.1	1,017.8	2,586.7	0.66	0.00	
6,491.0	1.70	207.30	5,530.9	-2,380.5	1,017.1	2,588.7	0.71	0.31	
6,587.0	1.60	212.00	5,626.9	-2,382.9	1,015.7	2,590.4	0.18	-0.10	
6,618.0	1.70	208.40	5,657.9	-2,383.7	1,015.3	2,590.9	0.46	0.32	Last CES Survey @ 6,618' MD
6,668.0	1.70	208.40	5,707.8	-2,385.0	1,014.6	2,591.8	0.00	0.00	PTB @ 6,668'

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Island Ranch 21D-24 TC - hit/miss target - Shape	0.00	0.00	3,800.5	-2,370.3	1,002.0	590,682.59	1,276,924.85	39.427250	-108.060047
- actual wellpath misses target center by 18.4usft at 4759.9usft MD (3803.8 TVD, -2352.7 N, 1005.9 E)									
- Circle (radius 50.0)									
Island Ranch 21D-24 PE - hit/miss target - Shape	0.00	0.00	5,668.5	-2,370.3	1,002.0	590,682.59	1,276,924.85	39.427250	-108.060047
- actual wellpath misses target center by 21.6usft at 6618.0usft MD (5657.9 TVD, -2383.7 N, 1015.3 E)									
- Circle (radius 50.0)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
6,618.0	5,657.9	-2,383.7	1,015.3	Last CES Survey @ 6,618' MD
6,668.0	5,707.8	-2,385.0	1,014.6	PTB @ 6,668'

Checked By: _____ Approved By: _____ Date: _____